

IN THE ABSTRACT

An apparatus for replacing at least a portion of an intervertebral disc in a spinal column includes: a first member having a ~~first vertebral contact surface for engagement with an endplate of a first vertebral bone in the spinal column, and having~~ first articulation surface that is defined at least by a concave arc having a radius of curvature A about a first axis substantially perpendicular to an anterior-posterior plane of the spinal column, and by a convex arc having a radius of curvature B about a first axis substantially perpendicular to a lateral plane of the spinal column. The apparatus includes ; and a second member having a ~~second vertebral contact surface for engagement with an endplate of a second vertebral bone in the spinal column, and having~~ second articulation surface that is defined at least by a convex arc having a radius of curvature C about a second axis substantially perpendicular to the anterior-posterior plane of the spinal column, and by a concave arc having a radius of curvature D about a second axis substantially perpendicular to the lateral plane of the spinal column. wherein: an intervertebral disc space is defined substantially between the first and second endplates of the first and second vertebral bones, and the radii of curvature of the first and second articulation surfaces are sized such so that the first and second articulation surfaces engage one another when the first and second members are disposed in an the intervertebral disc space to enable the first and second vertebral bones to articulate in at least one of flexion, extension and lateral bending. The first member has a first center of rotation located below the articulation surfaces during flexion/extension and a second center of rotation located above the articulation surfaces during lateral bending.